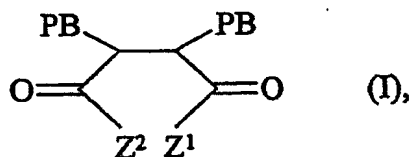


**What is Claimed:**

1. A copolymer comprising:  
a first structural element having Formula I:



wherein:

PB is a carbon-carbon polymer backbone;

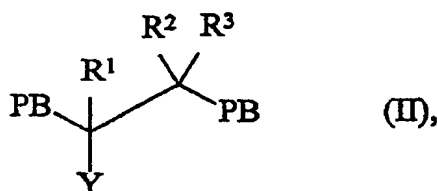
$Z^1$  and  $Z^2$  are, independently,  $OM^+$  or  $ON^+(R)_4$ , wherein M is Na, Li, or K, and R is, independently, H, linear C1-C18 alkyl, an amino sugar, or  $(CH_2CHR'O)_mL$ , wherein m is an integer from 1 to about 20, R' is, independently, H or a C1-C24 alkyl radical; and L is H,  $CH_2CHR'N(R')_2$  or  $CH_2CHR'N^+(R')_3$ ;

alternatively,  $Z^2$  is  $XR''$ , wherein X is O or NH, and R'' is, independently, H, R, a fluorine-substituted saturated or unsaturated C1-C18 radical, a fluorine-substituted saturated or unsaturated mono or polycyclic C4-C24 radical, or a fluorine-substituted aryl or heteroaryl C6-C24 radical;

alternatively,  $Z^1$  is  $X'R^N$  and  $Z^2$  is  $X'R^N$ , wherein X' is O, S or  $NR'$ , and  $R^N$  is, independently, a C2-C25 alkyl radical substituted with at least one amino group or a C5-C25 cycloalkyl radical having at least one amino group;

alternatively,  $Z^1$  and  $Z^2$  combine to form NR,  $NR''$ , or  $NR^N$ ;

and a second structural element having Formula II:



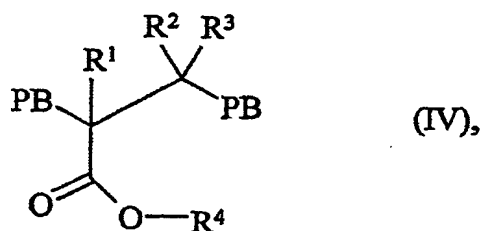
wherein:

$R^1$ ,  $R^2$ , and  $R^3$  are, independently, H, or C1-C4 alkyl;

Y is R, a fluorine-substituted C1-C24 alkyl radical, a fluorine-substituted cycloalkyl or aryl C6-C24 radical, C(O)OR, a fluorine-substituted C7-C24 alkaryl radical, or a fluorine-substituted alkoxyalkaryl radical;

provided that the copolymer contains at least one fluorine-substituted radical.

2. The copolymer of claim 1, wherein R is aminosorbitol,  $\beta$ -D-glucopyranosylamine or  $\beta$ -D-glucosamine.
3. The copolymer of claim 1, wherein  $Z^1$  or  $Z^2$  is  $\text{ONa}^+$ ,  $\text{NH}_4^+$ , or  $\text{XR}^N$ .
4. The copolymer of claim 1, wherein  $Z^1$  is  $\text{ONa}^+$  or  $\text{ONH}_4^+$  and  $Z^2$  is  $\text{NHR}''$ .
5. The copolymer of claim 1, wherein  $Z^1$  and  $Z^2$ , taken together, are  $\text{NR}''$ .
6. The copolymer of claim 1, wherein  $Z^1$  and  $Z^2$ , taken together, are other than  $\text{NR}''$  or  $\text{NR}^N$ .
7. The copolymer of claim 1, wherein the copolymer has a water solubility of at least 0.1% by weight at 20°C.
8. The copolymer of claim 1, wherein the copolymer comprises at least 10 mol% of the first structural element.
9. The copolymer of claim 1, further comprising a structural element having Formula IV:

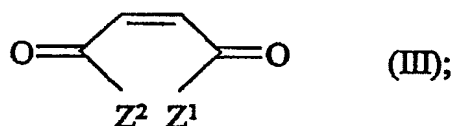


wherein  $\text{R}^4$  is  $\text{R}''$ .

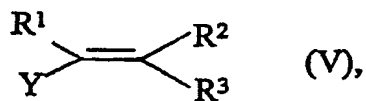
10. The copolymer of claim 1, wherein the copolymer has a molecular weight of at least

5000 g/mol.

11. The copolymer of claim 1, wherein the copolymer has a fluorine content of at least 5 mol%.
12. The copolymer of claim 1, wherein the copolymer has a polydispersity of less than 7.
13. A composition comprising at least 0.1% of the copolymer of claim 1 by weight of the composition.
14. The composition of claim 13, further comprising water.
15. A process for forming the copolymer of claim 1, the process comprising:  
contacting at least one monomer having Formula III:

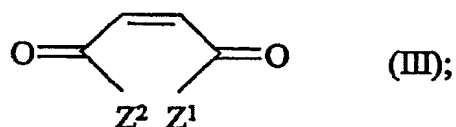


with a monomer having Formula V:

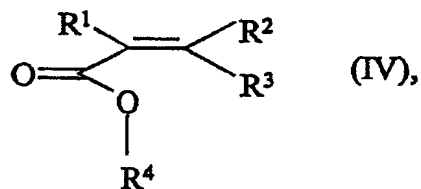


added dropwise during the copolymerization.

16. A process for forming the copolymer of claim 1, the process comprising:  
contacting at least one monomer having Formula III:



with a monomer having Formula IV:



present in excess during the copolymerization.

17. A process for using the copolymer of claim 1, said process comprising:  
applying the copolymer of claim 1 to a surface, thereby forming a surface coating.
18. The process of claim 17, further comprising:  
decreasing the water solubility or water emulsibility of said copolymer in the surface coating.
19. The process of claim 18, wherein thermal treatment is used to decrease the water solubility or water emulsibility of said copolymer.
20. The process of claim 17, wherein the surface is leather, fabric, or web.
21. The process of claim 17, wherein the surface comprises fabric or web comprising at least one fiber selected from the group consisting of manufactured fiber and natural fiber.